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PATENT

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Box Patent Application
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Washington, D.C. 20231

NEW APPLICATION TRANSMITTAL

Transmitted herewith for filing is the patent application of
Inventor(s): Sean J. Whitmarsh

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For (title): THRESHOLD WARNING SYSTEM FOR WHEELCHAIR LIFTS

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THRESHOLD WARNING SYSTEM

FOR WHEELCHAIR LIFTS

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BACKGROUND OF THE INVENTION

1. Field of the Invention

The present invention generally relates to the field of warning systems. More particularly, the present invention relates to the field of audible and/or visual warning systems for use in vehicular lifts.

2. Description of the Prior Art

Specifically, safety is always the most important concern in the use of wheelchair lifts. Many improvements have been accomplished in the past years in designing and manufacturing different types of wheelchair lifts. Related standards for wheelchair lifts are established by, for example, Society of Automotive Engineers (SAE) to provide industrial standards to monitor and test wheelchair lifts. All wheelchair lift

1 manufacturers must enforce and follow related industrial standards to ensure the products
2 delivered are safe and reliable.

3
4 In SAE standard No. J2093, there is a threshold warning requirement for
5 wheelchair lifts. Specifically, the standard states that each wheelchair lift shall include a
6 threshold warning system to give an audible and/or visual warning to a wheelchair
7 passenger approaching the lift to a vehicle floor level that the lift platform is more than
8 one (1) inch below the vehicle floor level and the warning system sensor shall cover an
9 access area not less than eighteen (18) inches away from a threshold.
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12 It is desirable to provide a threshold warning system which meets the SAE
13 standard No. J2093 mentioned above.
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SUMMARY OF THE INVENTION

The present invention is a threshold warning system for use with a conventional vehicular lift. The present invention threshold warning system is installed directly on the vehicular lift to fully comply with the SAE standard No. J2093. The threshold warning system comprises an audible and/or visual warning device for warning a user or a passenger that the user or passenger has entered a threshold zone while the platform is below the vehicle floor level. The threshold warning system further comprises a sensor device for sensing whether an object has crossed a pre-defined distance from an opening of the vehicle. The object can be anything, such as a person (a user or passenger) or a wheelchair, or anything that would indicate that it is too close to the threshold while the platform is in an unsafe position. The threshold is the outer most edge of the floor within the vehicle opening. The sensor device can cover the access area with a variety of distance ranges away from the threshold which creates the possibility of an even higher level of protection, exceeding the SAE standard.

It is one object of the present invention to provide a threshold warning system which is in full compliance with the SAE standard No. J2093.

It is another object of the present invention to provide a threshold warning system on a vehicular lift as a safety means for any edge unprotected with a physical barrier on a vehicle opening.

Further novel features and other objects of the present invention will become apparent from the following detailed description, discussion and the appended claims, taken in conjunction with the drawings.

BRIEF DESCRIPTION OF THE DRAWINGS

The following figures are for the purpose of demonstrating a specific application and are not intended to limit the scope of the invention.

FIG. 1 is an enlarged rear isometric view of a vehicular wheelchair lift when it is in an entry level position, showing the present invention threshold warning system;

FIG. 2 is a front isometric view of the wheelchair lift shown in FIG. 1, showing a cam assembly of the present invention threshold warning system at a position relative to the platform position;

FIG. 3 is a front isometric view of the wheelchair lift when it is in a ground level position, showing the cam assembly of the present invention threshold warning system at a position relative to the platform position;

FIG. 4 is a plan view of the cam assembly of the present invention threshold warning system;

FIG. 5 is a block diagram of the present invention threshold warning system; and

FIG. 6 is a front isometric view of another vehicular wheelchair lift when it is in a ground level position, showing the present invention threshold warning system installed thereto.

DESCRIPTION OF THE PREFERRED EMBODIMENT

Although specific embodiments of the present invention will now be described with reference to the drawings, it should be understood that such embodiments are by way of example only and merely illustrative of but a small number of the many possible specific embodiments which can represent applications of the principles of the present invention. Various changes and modifications obvious to one skilled in the art to which the present invention pertains are deemed to be within the spirit, scope and contemplation of the present invention as further defined in the appended claims.

Referring now to Figures 1, 2 and 3, there are shown isometric views of a conventional lift 2 such as a wheelchair lift with the present invention threshold warning system 10 installed thereto. For demonstration purposes, a wheelchair lift is presented. The wheelchair lift 2 is installed within a vehicle (not shown) which has an opening such as a side or rear door opening (not shown) and a floor (not shown). The wheelchair lift 2 basically includes a mounting assembly 3, an actuating system such as a hydraulic actuating system 4, a platform assembly 5, a linking assembly 6, and the present invention threshold warning system 10. It noted that while a hydraulic actuating system is illustrated in the drawings and described herein below, the present invention can be used in conjunction with any type of actuating systems, either a manual actuating system or a power actuating system (electrical or hydraulic or otherwise).

Since the lift 2 is conventional in the art, the description thereof will only be described in general terms. The mounting assembly 3 is conventionally mounted on the vehicle floor adjacent to the vehicle door opening. The hydraulic actuating system 4 comprises at least one single hydraulic cylinder (not shown) which is installed within a

1 tower housing 7 affixed on the mounting assembly 3. The linking assembly 6 is
2 connecting the hydraulic actuating system 4 through the housing 7 and the platform
3 assembly 5 for manually or automatically moving the platform assembly 5 from a stow
4 position inside the vehicle to an entry level position at the vehicle door opening and
5 inversely, and moving the platform assembly 5 between the entry level position and a
6 ground level position outside the vehicle and inversely, or only moving the platform
7 between the entry and the ground level positions.
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10 The present invention threshold warning system 10 is used in conjunction with the
11 lift 2 for notifying a passenger in a wheelchair that the position of the platform assembly
12 5 is in an unsafe level for exiting from or boarding into the vehicle. The warning system
13 10 warns a user in the wheelchair lift that the platform assembly 5 is not at a safe level for
14 boarding. The criteria used to determine this unsafe condition is as follows: (a) the
15 platform assembly 5 is lower than the acceptable boarding level; and (b) an object moves
16 into a threshold zone either from inside of the vehicle or moves from the platform into the
17 vehicle, where the lift 2 is installed. Both conditions must be met for the system to warn
18 the user.
19

20 It should be pointed out that the warning system may be used to provide a
21 warning signal when an object moves into the platform from the inside of the vehicle or
22 moves to the vehicle from the platform. The illustrations in the drawings and the
23 following description only demonstrate one situation in which the warning system warns
24 a user in a wheelchair that the platform assembly 5 is not at a safe level for exiting the
25 vehicle, but the present invention is applicable to both situations.
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1 The warning system 10 comprises a sensor means 12, a reflector means 14, a
2 warning means 16, a cam assembly 18, and a control circuit means 20. The sensor means
3 12 is adjustably mounted adjacent to an upper end 8 of the housing 7 for emitting an
4 infrared beam (shown as dashed lines) directly across the vehicle door opening to the
5 reflector means 14 which is remotely mounted adjacent to the mounting assembly 3. The
6 reflector means 14 reflects the infrared beam which bounces back to the sensor means 12
7 that the infrared beam is uninterrupted (unbroken). To make the sensor means 12 less
8 sensitive to ambient light, the beam is modulated. As one example, the beam is
9 modulated by way of pulsing at 3kHz. If the beam is interrupted (broken), the sensor
10 means 12 generates and transmits an output signal to the control means 20 to inform the
11 control means 20 that the beam is interrupted. The sensor means 12 senses a threshold
12 zone 23 adjacent to the vehicle opening to determine if an object is entering into the
13 threshold zone 23, which is an area within a depth "D" of a pre-defined distance such as
14 eighteen inches (18") from the threshold 22. The object can be anything, but the goal is
15 to sense a person (a user of a wheelchair or simply a passenger), a wheelchair, or
16 anything that would indicate that it is too close to the threshold zone 23 while the
17 platform assembly 5 is in an unsafe position. The sensor means 12 can cover the access
18 area (D) with a variety of pre-defined distance ranges away from the threshold 22 which
19 creates even a higher level of protection.
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21

22 It will be appreciated that the sensor means can be a passive infrared device
23 (motion sensor), a radar reflection (HF radio waves) or an ultrasonic reflection (ultrasonic
24 sounds), sensitive mat, sensitive trip and sensitive bladder, which are also within the
25 spirit and scope of the present invention.
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Figure 4 shows a plan view of the cam assembly 18. Referring to Figures 2, 3 and 4, the cam assembly 18 is used for determining the position of the platform assembly 5. The cam assembly 18 comprises a limit switch 24 and a cam wheel 26. Both the limit switch 24 and the cam wheel 26 are mounted on a mounting plate 28 which is mounted on the housing 7. The cam wheel 26 moves together with the linkage axle 27 and has a lower perimeter region 30 and a higher perimeter region 32 such that when the higher perimeter region 32 engages with the limit switch 24, thereby activating the limit switch 24 to generate an output signal to control means 20 to inform the control means 20 that the platform assembly 5 is in an unsafe level for exiting from the vehicle. The cam wheel 26 is located relative to the limit switch 24 and rotates with the movement of the platform assembly 5. For example, between the ground level and unsafe boarding level, the cam wheel 26 will actuate the limit switch 24 (see Figure 3), and at the safe boarding level the cam wheel 26 will release the limit switch 24 (see Figure 2). Obviously this arrangement may be reversed. Alternatively, the arrangement of the high and low perimeter regions on the cam wheel may be reversed. In addition, instead of actuating the limit switch when the lift is unsafe to use and generating an output signal, the cam wheel may actuating the limit switch when the lift is in a safe position. It is the change of the states or condition of the limit switch when the platform position changes from safe to unsafe or from unsafe to safe that informs the control means that the platform is unsafe or unsafe for use which in turn cause a warning signal to be generated.

The warning means 16 is mounted on the housing 7 adjacent to the upper end 8. The warning means 16 can be an audio warning device or a visual warning device. The warning means 16 is electrically coupled to the control means 20 such that when the warning means 16 receives an unsafe output signal from the control means 20, and thereby activates the warning means 16 that the platform assembly 5 is in the unsafe level

1 for exiting from or boarding into the vehicle.
2

3 Referring to Figure 5, there is shown a block diagram of the present invention
4 threshold warning system 10. The limit switch 24 of the cam assembly 18 is electrically
5 coupled to a first input 40 of the control circuit means 20, where the limit switch 24
6 transmits an output signal to the control circuit means 20. The sensor means 12 is
7 electrically coupled to a detector circuit 36 which is designed so that it is only sensitive to
8 the modulated beam. The detector circuit 36 is electrically coupled to a second input 42
9 of the control circuit means 20 and transmits an output signal to the control circuit means
10 20. The control circuit means 20 processes the two output signals and generates an
11 unsafe output signal to a signal receiving circuit 38 which in turn triggers the warning
12 means 16 to alert the user that the platform assembly 5 is in an unsafe level for exiting
13 from or boarding into the vehicle.
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15

16 It will be appreciated that the circuits mentioned above are conventional in the art.
17 For example, the circuits can be designed with a micro-controller device which can be
18 programmed to perform a specific function, conditional logic, discrete analog device, or
19 relay logic, *etc.*
20

21 Referring to Figure 6, there is shown an isometric view of another type of
22 wheelchair lift 102 which can be utilized with the present invention threshold warning
23 system. It will be appreciated that the present invention threshold warning system can be
24 incorporated with any type of wheelchair lift, person lift, or any device installed at the
25 elevated threshold of a doorway, where the movement of the device creates an unsafe
26 condition and the physical barrier cannot be incorporated.
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Defined in detail, the present invention is a wheelchair lift for use in conjunction with a vehicle having an opening and a floor, the wheelchair lift comprising:

(a) a mounting assembly mounted on the vehicle floor adjacent to the vehicle opening;

(b) an actuating system which is affixed to the mounting assembly and including at least one actuating means; (c) a platform assembly; (d) a linking assembly connecting to the actuating system and the platform assembly for moving the platform assembly between an entry level position and a ground level position outside the vehicle and inversely; (e) a warning system for providing warning when an object moves into a threshold zone while the platform assembly is in an unsafe level, the warning system including a sensor means, a reflector means, a warning means, a platform position indication means, and a control means. The sensor means arranged for emitting an infrared beam directly across the vehicle opening to the reflector means which is mounted remotely from the sensor means, where the reflector means reflects the infrared beam back to the sensor means such that the infrared beam is uninterrupted for sensing if an object moves into a threshold zone adjacent to the vehicle opening. The platform position indication means arranged for determining the position of the platform assembly and comprising a cam wheel which is located relative to a limit switch and rotates with the movement of the platform assembly, wherein the cam wheel changes the condition of the limit switch when the platform assembly is in an unsafe level. The control means having a first input coupled to the platform position indication means for receiving a platform signal, a second input coupled to the sensor means for receiving a threshold signal, and an output for transmitting an output signal based on the conditions of the platform signal and the threshold signal. The warning means coupled to the output of the control means for receiving the output signal from the control means which in turn activates the warning means to indicate that an object moves into the threshold zone while the platform assembly is in the unsafe level. The threshold warning system of the wheelchair lift

1 provides warning when an object moves into the threshold zone while the platform
2 assembly is in the unsafe level.

3
4 Defined broadly, the present invention is a threshold warning system for a lift
5 which is used in conjunction with a vehicle having an opening and a floor, the lift
6 including a mounting assembly being mounted on the vehicle floor adjacent to the vehicle
7 opening, an actuating system mounted on the mounting assembly, a platform assembly,
8 and a linking assembly connecting to the actuating system and the platform assembly for
9 moving the platform assembly between an entry level position and a ground level
10 position outside the vehicle and inversely, the threshold warning system comprising:
11 (a) a sensor means for emitting an infrared beam directly across the vehicle opening for
12 sensing a threshold zone adjacent to the vehicle opening when an object moves into the
13 threshold zone; (b) a reflector means for mounting adjacent to the mounting assembly and
14 remotely located from the sensor means, where the reflector means reflects the infrared
15 beam back to the sensor means such that the infrared beam is uninterrupted; (c) a cam
16 assembly for determining the position of the platform assembly which switches a limit
17 switch when the platform is in a unsafe level; (d) a control means having a first input
18 coupled to the limit switch for determining the condition of the limit switch, a second
19 input coupled to the sensor means for determining the condition of the sensor means, and
20 an output for transmitting an output signal based on the conditions of the limit switch and
21 the sensor means; (e) a warning means coupled to the output of the control means for
22 receiving the unsafe output signal from the control means which in turn activates the
23 warning means to indicate that the platform assembly is in the unsafe level and an object
24 moves into the threshold zone; (f) whereby the threshold warning system provides
25 warning when an object moves into the threshold zone while the platform assembly is in
26 the unsafe level.
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1 Defined more broadly, the present invention is a warning system for a lift which is
2 used in conjunction with a vehicle having an opening and a floor, the lift including a
3 platform, the warning system comprising: (a) means for sensing a threshold zone adjacent
4 to the vehicle opening and transmitting a threshold output signal when an object moves
5 into the threshold zone; (b) means for determining the position of the platform and
6 transmitting a position output signal; and (c) means for generating a warning signal based
7 on the conditions of the threshold output signal and the position output signal;
8 (d) whereby the warning system provides warning when an object moves into the
9 threshold zone while the platform is in the unsafe level.
10

11
12 Of course the present invention is not intended to be restricted to any particular
13 form or arrangement, or any specific embodiment disclosed herein, or any specific use,
14 since the same may be modified in various particulars or relations without departing from
15 the spirit or scope of the claimed invention herein above shown and described of which
16 the apparatus shown is intended only for illustration and for disclosure of an operative
17 embodiment and not to show all of the various forms or modifications in which the
18 present invention might be embodied or operated.
19

20 The present invention has been described in considerable detail in order to comply
21 with the patent laws by providing full public disclosure of at least one of its forms.
22 However, such detailed description is not intended in any way to limit the broad features
23 or principles of the present invention, or the scope of patent monopoly to be granted.
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25 **WHAT IS CLAIMED IS:**
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1. A warning system for a lift which is used in conjunction with a vehicle having an opening and a floor, the lift including a platform, the warning system comprising:

- a. means for sensing a threshold zone adjacent to said vehicle opening and transmitting a threshold output signal when an object moves into the threshold zone;
- b. means for determining the position of said platform and transmitting a position output signal; and
- c. means for generating a warning signal based on the conditions of said threshold output signal and said position output signal;
- d. whereby said warning system provides warning when an object moves into said threshold zone while said platform is in said unsafe level.

2. The warning system in accordance with Claim 1 wherein said sensing means includes a sensor and a reflector, where the sensor emits an infrared beam to the reflector.

3. The warning system in accordance with Claim 2 wherein said infrared beam is modulated for the purposes of distinguishing the beam from ambient light.

5. The warning system in accordance with Claim 1 wherein said sensing means comprises a passive infrared device.

6. The warning system in accordance with Claim 5 wherein said passive infrared device comprises a motion sensor.

7. The warning system in accordance with Claim 1 wherein said sensing means

comprises a radar reflection by HF radio waves.

8. The warning system in accordance with Claim 1 wherein said sensing means comprises an ultrasonic reflection by ultrasonic sounds.
9. The warning system in accordance with Claim 1 wherein said sensing means comprises pressure sensitive mat.
10. The warning system in accordance with Claim 1 wherein said sensing means comprises pressure sensitive strip.
11. The warning system in accordance with Claim 1 wherein said sensing means comprises pressure sensitive bladder.
12. The warning system in accordance with Claim 1 wherein the condition of said threshold output signal transmitted by said sensing means changes when said sensing means senses an object crossing a boundary of said threshold zone.
13. The warning system in accordance with Claim 1 wherein said means for determining the position of said platform transmits said platform output signal when said platform is in an unsafe level.
14. The warning system in accordance with Claim 1 wherein said means for determining the position of said platform stops transmitting said platform output signal when said platform is in an unsafe level.

15. The warning system in accordance with Claim 1 wherein the condition of said platform output signal transmitted by said means for determining the position of said platform changes when the position of said platform changes between an unsafe level and a safe level.
16. The warning system in accordance with Claim 1 wherein said warning means is an audio warning device.
17. The warning system in accordance with Claim 1 wherein said warning means is a visual warning device.
18. The warning system in accordance with Claim 1 wherein said unsafe level is a platform position which is lower than an entry level position at said vehicle opening.
19. The warning system in accordance with Claim 1 wherein said threshold zone has a depth of a pre-defined safe distance.
20. The warning system in accordance with Claim 19 wherein said pre-defined safe distance is not less than eighteen (18) inches.
21. A threshold warning system for a lift which is used in conjunction with a vehicle having an opening and a floor, the lift including a mounting assembly being mounted on the vehicle floor adjacent to the vehicle opening, an actuating system mounted on the mounting assembly, a platform assembly, and a linking assembly connecting to the actuating system and the platform assembly for moving the

platform assembly between an entry level position and a ground level position outside the vehicle and inversely, the threshold warning system comprising:

- a. a sensor means for emitting an infrared beam directly across said vehicle opening for sensing a threshold zone adjacent to said vehicle opening when an object moves into the threshold zone;
- b. a reflector means for mounting adjacent to said mounting assembly and remotely located from said sensor means, where said reflector means reflects said infrared beam back to said sensor means such that said infrared beam is uninterrupted;
- c. a cam assembly for determining the position of said platform assembly which switches a limit switch when said platform is in a unsafe level;
- d. a control means having a first input coupled to said limit switch for determining the condition of said limit switch, a second input coupled to said sensor means for determining the condition of said sensor means, and an output for transmitting an output signal based on the conditions of said limit switch and said sensor means;
- e. a warning means coupled to said output of said control means for receiving said unsafe output signal from said control means which in turn activates the warning means to indicate that said platform assembly is in said unsafe level and an object moves into said threshold zone;
- f. whereby said threshold warning system provides warning when an object moves into said threshold zone while said platform assembly is in said unsafe level.

22. The threshold warning system in accordance with Claim 21 wherein said infrared beam is modulated for the purpose of distinguishing the beam from ambient light.

23. The threshold warning system in accordance with Claim 21 wherein said cam assembly comprises a cam wheel which is located relative to said limit switch and rotates with the movement of said platform assembly.
24. The threshold warning system in accordance with Claim 21 wherein said warning means is an audio warning device.
25. The threshold warning system in accordance with Claim 21 wherein said warning means is a visual warning device.
26. The warning system in accordance with Claim 21 wherein said unsafe level is a platform position which is lower than an entry level position at said vehicle opening.
27. The warning system in accordance with Claim 21 wherein said threshold zone has a depth of a pre-defined safe distance.
28. The warning system in accordance with Claim 27 wherein said pre-defined safe distance is not less than eighteen (18) inches.
29. A wheelchair lift for use in conjunction with a vehicle having an opening and a floor, the wheelchair lift comprising:
- a. a mounting assembly mounted on said vehicle floor adjacent to said vehicle opening;
 - b. an actuating system which is affixed to said mounting assembly and including at least one actuating means;

- c. a platform assembly;
- d. a linking assembly connecting to said actuating system and said platform assembly for moving said platform assembly between an entry level position and a ground level position outside said vehicle and inversely;
- e. a warning system for providing warning when an object moves into a threshold zone while said platform assembly is in an unsafe level, the warning system including a sensor means, a reflector means, a warning means, a platform position indication means, and a control means:
- (i) said sensor means arranged for emitting an infrared beam directly across said vehicle opening to said reflector means which is mounted remotely from said sensor means, where said reflector means reflects the infrared beam back to said sensor means such that the infrared beam is uninterrupted for sensing if an object moves into a threshold zone adjacent to said vehicle opening,
 - (ii) said platform position indication means arranged for determining the position of said platform assembly and comprising a cam wheel which is located relative to a limit switch and rotates with the movement of said platform assembly, wherein the cam wheel changes the condition of the limit switch when said platform assembly is in an unsafe level;
 - (iii) said control means having a first input coupled to said platform position indication means for receiving a platform signal, a second input coupled to said sensor means for receiving a threshold signal, and an output for transmitting an output signal based on the conditions of said platform signal and said threshold signal; and
 - (iv) said warning means coupled to said output of said control means

for receiving said output signal from said control means which in turn activates said warning means to indicate that an object moves into said threshold zone while said platform assembly is in said unsafe level;

- f. whereby said threshold warning system of said wheelchair lift provides warning when an object moves into said threshold zone while said platform assembly is in said unsafe level.

30. The wheelchair lift in accordance with Claim 29 wherein said infrared beam is modulated for the purpose of distinguishing the beam from ambient light.
31. The wheelchair lift in accordance with Claim 29 wherein said warning means is an audio warning device.
32. The wheelchair lift in accordance with Claim 29 wherein said warning means is a visual warning device.
33. The warning system in accordance with Claim 29 wherein said unsafe level is a platform position which is lower than an entry level position at said vehicle opening.
34. The warning system in accordance with Claim 29 wherein said threshold zone has a depth of a pre-defined safe distance.
35. The warning system in accordance with Claim 34 wherein said pre-defined safe distance is not less than eighteen (18) inches.

ABSTRACT OF THE DISCLOSURE

A threshold warning system for use with a conventional lift. The threshold warning system is installed directly on the lift to fully comply with the SAE standard No. J2093. The threshold warning system comprises a sensor device for sensing whether there is an object crossing the boundary of the threshold zone, and a platform position indication device for determining whether the platform is in an unsafe position. The threshold warning system comprises an audible and/or visual warning device for warning a wheelchair user or a passenger when the user or passenger moves into a threshold zone from the vehicle opening while the platform is in an unsafe level for exiting from or boarding into the vehicle.

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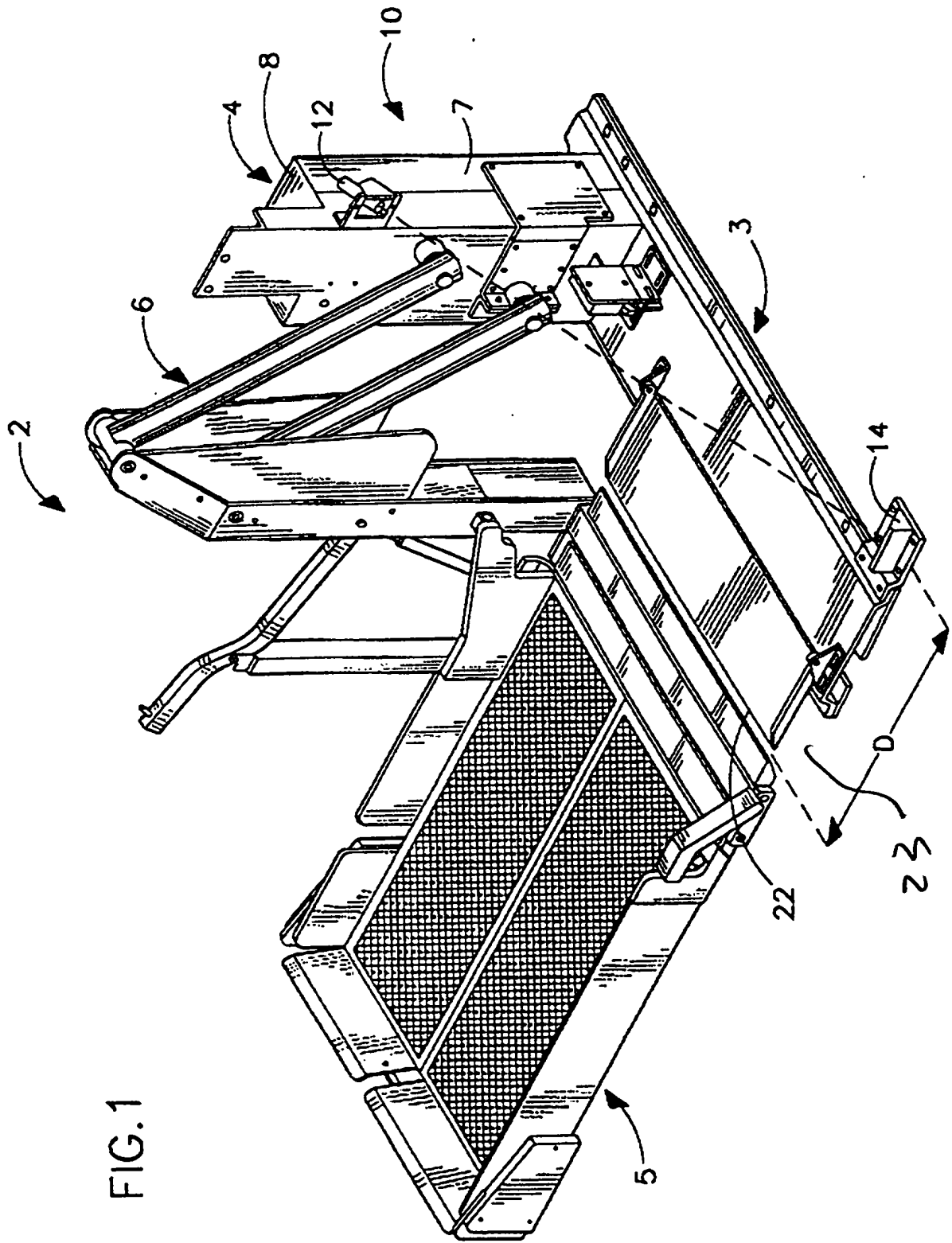


FIG.1

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FIG.2

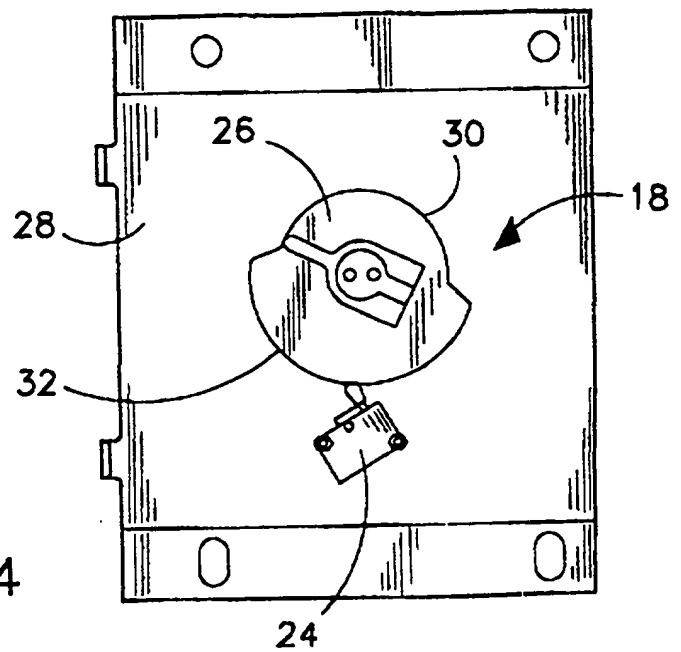
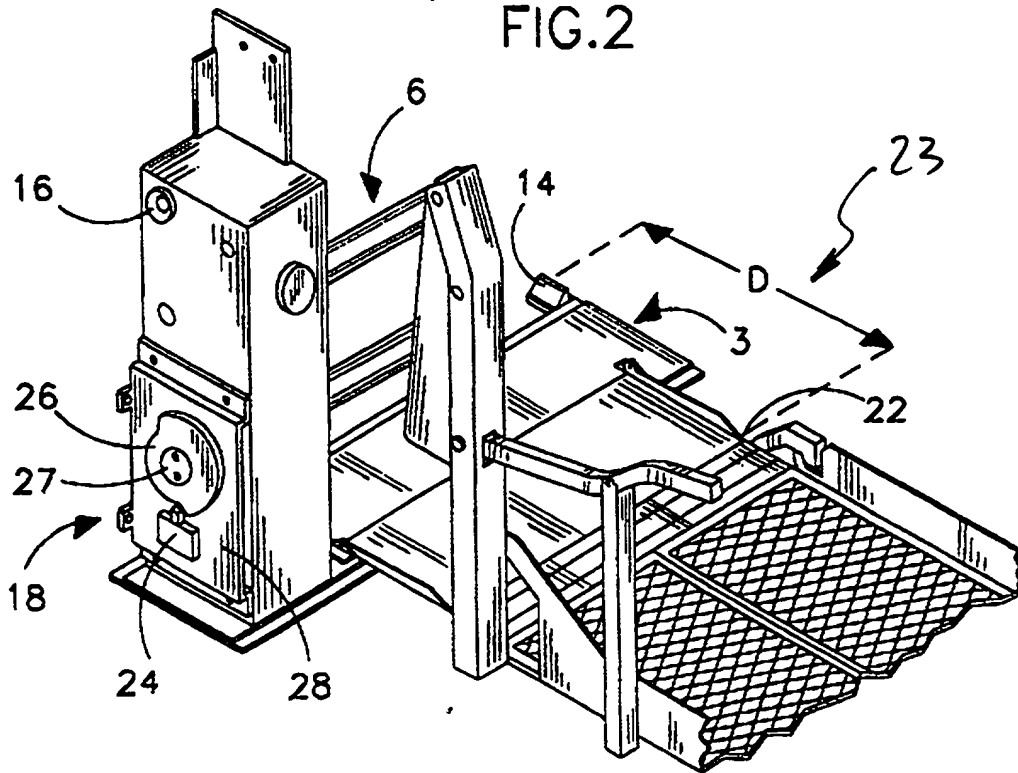
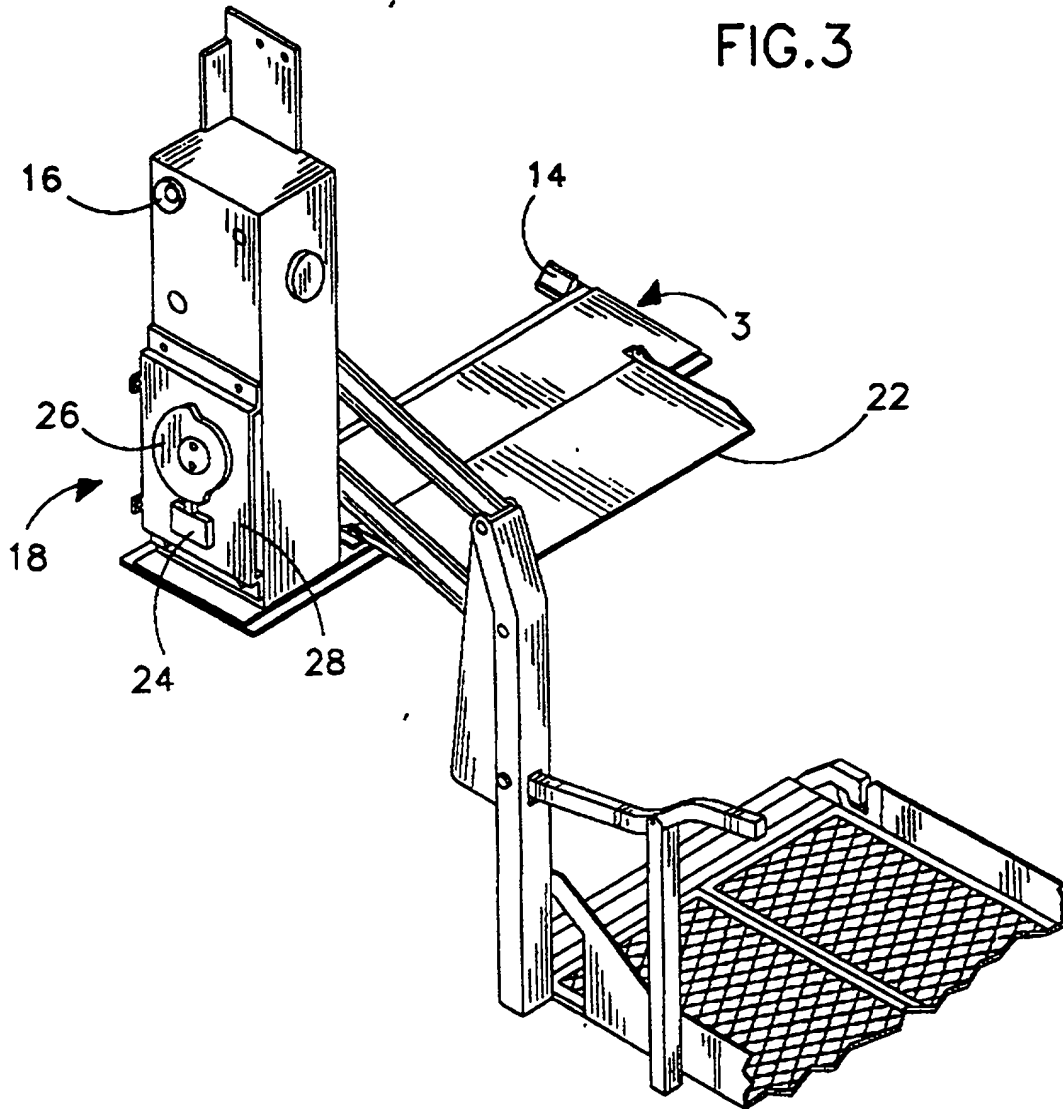


FIG.4

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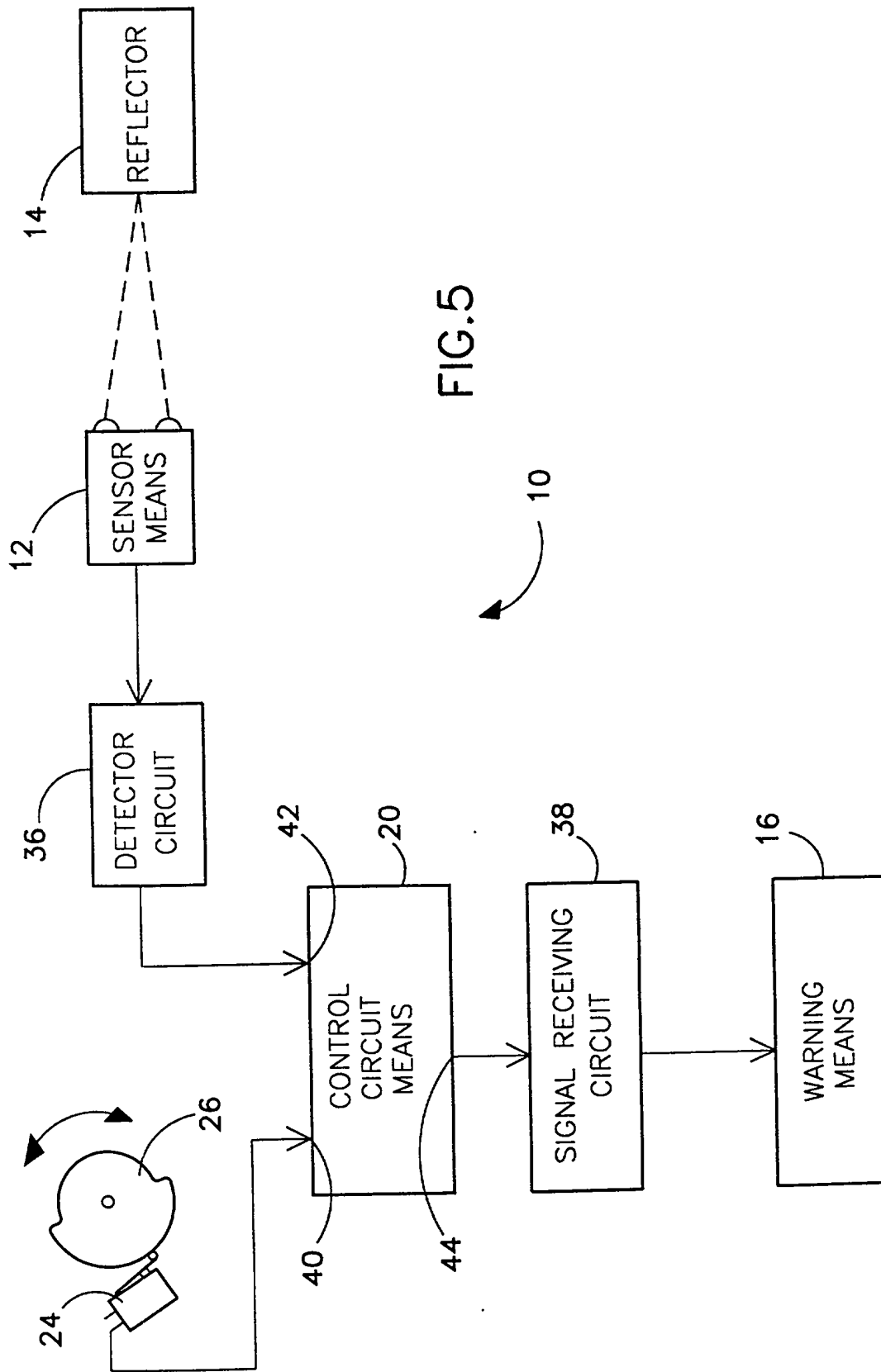
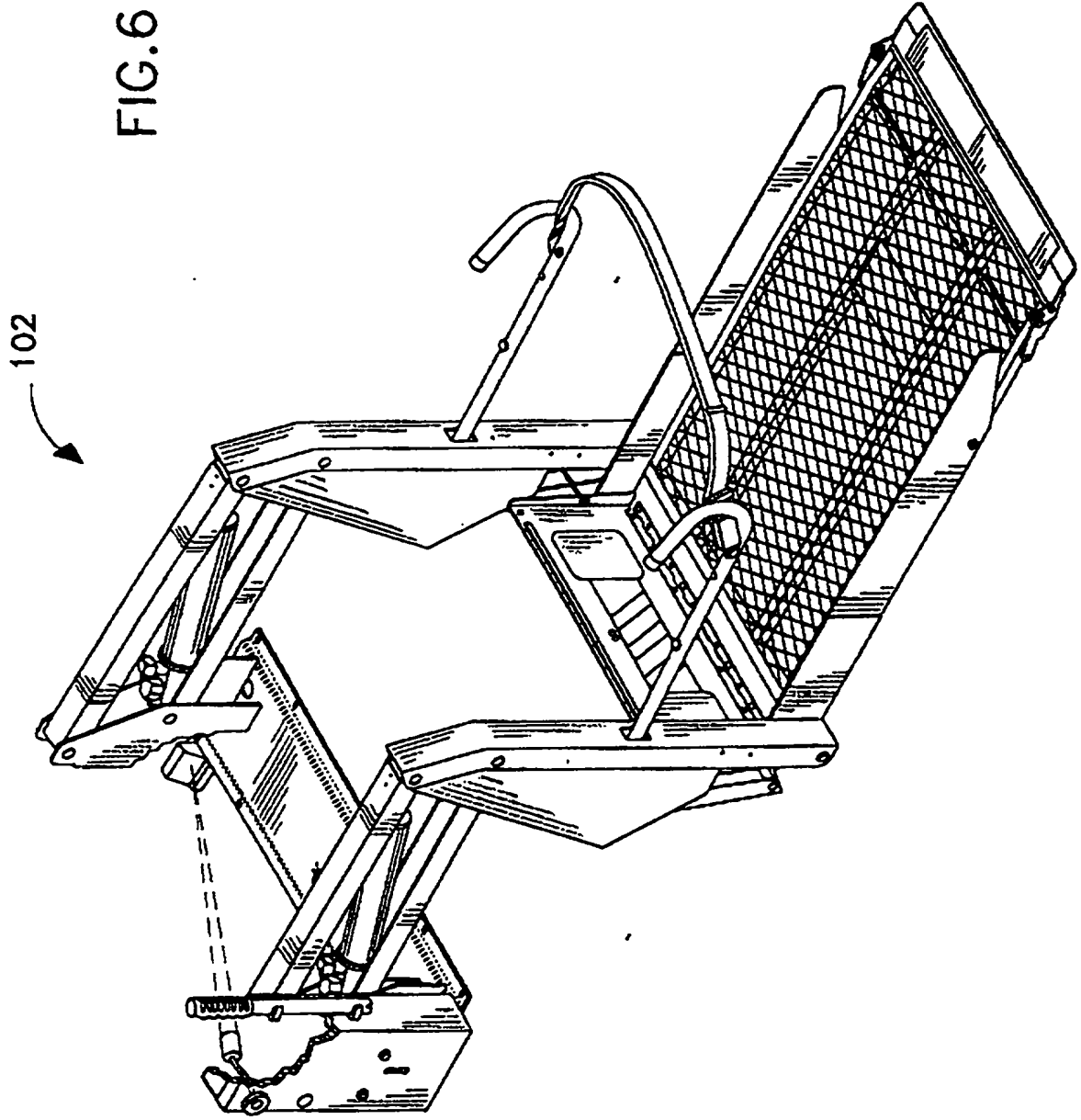


FIG. 5

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In re application of:

Serial No.: 0 (to be assigned) Group No.:

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by Inventor(s): **Sean J. Whitmarsh**

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As a below named inventor, I hereby declare that:

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- ☐ continuation.
- ☐ continuation-in-part (C-I-P).

INVENTORSHIP IDENTIFICATION

WARNING: If the inventors are each not the inventors of all the claims, an explanation of the facts, including the ownership of all the claims at the time the last claimed invention was made, should be submitted.

My residence, post office address and citizenship are as stated below, next to my name. I believe that I am the original, first and sole inventor (if only one name is listed below) or an original, first and joint inventor (if plural names are listed below) of the subject matter that is claimed, and for which a patent is sought on the invention entitled:

TITLE OF INVENTION

THRESHOLD WARNING SYSTEM FOR WHEELCHAIR LIFTS

SPECIFICATION IDENTIFICATION

the specification of which:

(complete (a), (b) or (c))

(a) ☒ is attached hereto.

NOTE: "The following combinations of information supplied in an oath or declaration filed on the application filing date with a specification are acceptable as minimums for identifying a specification and compliance with any one of the items below will be accepted as complying with the identification requirement of 37 CFR 1.63:

"(1) name of inventor(s), and reference to an attached specification which is both attached to the oath or declaration at the time of execution and submitted with the oath or declaration on filing;

"(2) name of inventor(s), and attorney docket number which was on the specification as filed;
or

"(3) name of inventor(s), and title which was on the specification as filed."

Notice of July 13, 1995 (1177 O.G. 60).

(b) ☐ was filed on _____, as ☐ Serial No. 0 / _____
or ☐ _____
and was amended on _____ (if applicable).

NOTE: Amendments filed after the original papers are deposited with the PTO that contain new matter are not accorded a filing date by being referred to in the declaration. Accordingly, the amendments involved are those filed with the application papers or, in the case of a supplemental declaration, are those amendments claiming matter not encompassed in the original statement of invention or claims. See 37 CFR 1.67.

NOTE: "The following combinations of information supplied in an oath or declaration filed after the filing date are acceptable as minimums for identifying a specification and compliance with any one of the items below will be accepted as complying with the identification requirement of 37 CFR 1.63:

"(1) name of inventor(s), and application number (consisting of the series code and the serial number; e.g., 08/123,456);

"(2) name of inventor(s), serial number and filing date;

"(3) name of inventor(s) and attorney docket number which was on the specification as filed;

"(4) name of inventor(s), title which was on the specification as filed and filing date;

"(5) name of inventor(s), title which was on the specification as filed and reference to an attached specification which is both attached to the oath or declaration at the time of execution and submitted with the oath or declaration; or

"(6) name of inventor(s), title which was on the specification as filed and accompanied by a cover letter accurately identifying the application for which it was intended by either the application number (consisting of the series code and the serial number; e.g., 08/123,456), or serial number and filing date. Absent any statement(s) to the contrary, it will be presumed that the application filed in the PTO is the application which the inventor(s) executed by signing the oath or declaration."

Notice of July 13, 1995 (1177 O.G. 60).

(c) ☐ was described and claimed in PCT International Application No. _____, filed on _____ and as amended under PCT Article 19 on _____ (if any).

ACKNOWLEDGEMENT OF REVIEW OF PAPERS AND DUTY OF CANDOR

I hereby state that I have reviewed and understand the contents of the above-identified specification, including the claims, as amended by any amendment referred to above.

I acknowledge the duty to disclose information, which is material to patentability as defined in 37, Code of Federal Regulations, § 1.56,

(also check the following items, if desired)

☒ and which is material to the examination of this application, namely, information where there is a substantial likelihood that a reasonable Examiner would consider it important in deciding whether to allow the application to issue as a patent, and

☒ in compliance with this duty, there is attached an information disclosure statement, in accordance with 37 CFR 1.98.

PRIORITY CLAIM (35 U.S.C. § 119(a)-(d))

I hereby claim foreign priority benefits under Title 35, United States Code, § 119(a)-(d) of any foreign application(s) for patent or inventor's certificate or of any PCT international application(s) designating at least one country other than the United States of America listed below and have also identified below any foreign application(s) for patent or inventor's certificate or any PCT international application(s) designating at least one country other than the United States of America filed by me on the same subject matter having a filing date before that of the application(s) of which priority is claimed.

(complete (d) or (e))

(d) ☒ no such applications have been filed.

(e) ☐ such applications have been filed as follows.

NOTE: Where item (c) is entered above and the International Application which designated the U.S. itself claimed priority check item (e), enter the details below and make the priority claim.

**PRIOR FOREIGN/PCT APPLICATION(S) FILED WITHIN 12 MONTHS
(6 MONTHS FOR DESIGN) PRIOR TO THIS APPLICATION
AND ANY PRIORITY CLAIMS UNDER 35 U.S.C. § 119(a)-(d)**

| COUNTRY (OR INDICATE IF PCT) | APPLICATION NUMBER | DATE OF FILING (day, month, year) | PRIORITY CLAIMED UNDER 37 USC 119 |
|------------------------------------|--------------------|--------------------------------------|---|
| | | | <input type="checkbox"/> YES NO <input type="checkbox"/> |
| | | | <input type="checkbox"/> YES NO <input type="checkbox"/> |
| | | | <input type="checkbox"/> YES NO <input type="checkbox"/> |
| | | | <input type="checkbox"/> YES NO <input type="checkbox"/> |
| | | | <input type="checkbox"/> YES NO <input type="checkbox"/> |

**CLAIM FOR BENEFIT OF PRIOR U.S. PROVISIONAL APPLICATION(S)
(34 U.S.C. § 119(e))**

I hereby claim the benefit under Title 35, United States Code, § 119(e) of any United States provisional application(s) listed below:

PROVISIONAL APPLICATION NUMBER

FILING DATE

____ / _____
 ____ / _____
 ____ / _____

**CLAIM FOR BENEFIT OF EARLIER US/PCT APPLICATION(S)
UNDER 35 U.S.C. 120**

- ☐ The claim for the benefit of any such applications are set forth in the attached ADDED PAGES TO COMBINED DECLARATION AND POWER OF ATTORNEY FOR DIVISIONAL, CONTINUATION OR CONTINUATION-IN-PART (C-I-P) APPLICATION.

**ALL FOREIGN APPLICATION(S), IF ANY, FILED MORE THAN 12 MONTHS
(6 MONTHS FOR DESIGN) PRIOR TO THIS U.S. APPLICATION**

NOTE: If the application filed more than 12 months from the filing date of this application is a PCT filing forming the basis for this application entering the United States as (1) the national stage, or (2) a continuation, divisional, or continuation-in-part, then also complete **ADDED PAGES TO COMBINED DECLARATION AND POWER OF ATTORNEY FOR DIVISIONAL, CONTINUATION OR C-I-P APPLICATION** for benefit of the prior U.S. or PCT application(s) under 35 U.S.C. § 120.

POWER OF ATTORNEY

I hereby appoint the following attorney(s) and/or agent(s) to prosecute this application and transact all business in the Patent and Trademark Office connected therewith.

(list name and registration number)

ROZSA & CHEN LLP

Thomas I. Rozsa, Esq., Registration No. 29,210

Tony D. Chen, Esq., Registration No. 36,998

John F. Sicotte, Esq., Registration No. 31,138

(check the following item, if applicable)

- ☐ Attached, as part of this declaration and power of attorney, is the authorization of the above-named attorney(s) to accept and follow instructions from my representative(s).

SEND CORRESPONDENCE TO

ROZSA & CHEN LLP

15910 Ventura Boulevard

Suite 1601

Encino, California 91436-2815

DIRECT TELEPHONE CALLS TO:
(Name and telephone number)

Thomas I. Rozsa

Tony D. Chen

John F. Sicotte
(818) 783-0990

DECLARATION

I hereby declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the United States Code, and that such willful false statements may jeopardize the validity of the application or any patent issued thereon.

(Declaration and Power of Attorney [1-1]—page 5 of 7)

SIGNATURE(S)

NOTE: Carefully indicate the family (or last) name, as it should appear on the filing receipt and all other documents.

Full name of sole or first inventor

Sean J. Whitmarsh
(GIVEN NAME) (MIDDLE INITIAL OR NAME) FAMILY (OR LAST NAME)

Inventor's signature Sean J. Whitmarsh

Date 5/13/98 Country of Citizenship United States

Residence Santa Clarita, California

Post Office Address 21309 Bottletree Lane, #102
Santa Clarita, California 91351

Full name of second joint inventor, if any

(GIVEN NAME) (MIDDLE INITIAL OR NAME) FAMILY (OR LAST NAME)

Inventor's signature _____

Date _____ Country of Citizenship _____

Residence _____

Post Office Address _____

Full name of third joint inventor, if any

(GIVEN NAME) (MIDDLE INITIAL OR NAME) FAMILY (OR LAST NAME)

Inventor's signature _____

Date _____ Country of Citizenship _____

Residence _____

Post Office Address _____

1. Type of Application

This new application is for a(n)

(check one applicable item below)

- ☒ Original (nonprovisional)
- ☐ Design
- ☐ Plant

WARNING: Do not use this transmittal for a completion in the U.S. of an International Application under 35 U.S.C. 371(c)(4), unless the International Application is being filed as a divisional, continuation or continuation-in-part application.

WARNING: Do not use this transmittal for the filing of a provisional application.

NOTE: If one of the following 3 items apply, then complete and attach ADDED PAGES FOR NEW APPLICATION TRANSMITTAL WHERE BENEFIT OF A PRIOR U.S. APPLICATION CLAIMED and a NOTIFICATION IN PARENT APPLICATION OF THE FILING OF THIS CONTINUATION APPLICATION.

- ☐ Divisional.
- ☐ Continuation.
- ☐ Continuation-in-part (C-I-P).

2. Benefit of Prior U.S. Application(s) (35 U.S.C. 119(e), 120, or 121)

NOTE: If the new application being transmitted is a divisional, continuation or a continuation-in-part of a parent case, or where the parent case is an International Application which designated the U.S., or benefit of a prior provisional application is claimed, then check the following item and complete and attach ADDED PAGES FOR NEW APPLICATION TRANSMITTAL WHERE BENEFIT OF PRIOR U.S. APPLICATION(S) CLAIMED.

WARNING: If an application claims the benefit of the filing date of an earlier filed application under 35 U.S.C. 120, 121 or 365(c), the 20-year term of that application will be based upon the filing date of the earliest U.S. application that the application makes reference to under 35 U.S.C. 120, 121 or 365(c). (35 U.S.C. 154(a)(2) does not take into account, for the determination of the patent term, any application on which priority is claimed under 35 U.S.C. 119, 365(a) or 365(b).) For a c-i-p application, applicant should review whether any claim in the patent that will issue is supported by an earlier application and, if not, the applicant should consider canceling the reference to the earlier filed application. The term of a patent is not based on a claim-by-claim approach. See Notice of April 14, 1995, 60 Fed. Reg. 20,195, at 20,205.

WARNING: When the last day of pendency of a provisional application falls on a Saturday, Sunday, or Federal holiday within the District of Columbia, any nonprovisional application claiming benefit of the provisional application must be filed prior to the Saturday, Sunday, or Federal holiday within the District of Columbia. See 37 C.F.R. § 1.78(a)(3).

- ☐ The new application being transmitted claims the benefit of prior U.S. application(s). Enclosed are ADDED PAGES FOR NEW APPLICATION TRANSMITTAL WHERE BENEFIT OF PRIOR U.S. APPLICATION(S) CLAIMED.

3. Papers Enclosed That Are Required for Filing Date under 37 C.F.R. 1.53(b) (Regular) or 37 C.F.R. 1.153 (Design) Application

12 Pages of specification

7 Pages of claims

1 Pages of Abstract

5 Sheets of drawing

- ☒ formal (three photocopies)
- ☐ informal

060798-03

(complete the following, if applicable)

- 4. Additional papers enclosed**

- ## 5. Declaration or oath

- (check all applicable boxes)

- WARNING:** Where the filing is a completion in the U.S. of an International Application, but where a declaration is not available, or where the completion of the U.S. application contains subject matter in addition to the International Application, the application may be treated as a continuation or continuation-in-part, as the case may be, utilizing ADDED PAGE FOR NEW APPLICATION TRANSMITTAL WHERE BENEFIT OF PRIOR U.S. APPLICATION CLAIMED.

- ☐ Application is made by a person authorized under 37 C.F.R. 1.41(c) on behalf of all the above named inventor(s).

(The declaration or oath, along with the surcharge required by 37 CFR 1.16(e) can be filed subsequently).

NOTE: *It is important that all the correct inventor(s) are named for filing under 37 CFR 1.41(c) and 1.53(b).*

- ☐ Showing that the filing is authorized.
(not required unless called into question. 37 CFR 1.41(d))

6. Inventorship Statement

WARNING: *If the named inventors are each not the inventors of all the claims an explanation, including the ownership of the various claims at the time the last claimed invention was made, should be submitted.*

The inventorship for all the claims in this application are:

- ☒ The same.

or

- ☐ Not the same. An explanation, including the ownership of the various claims at the time the last claimed invention was made,
☐ is submitted.
☐ will be submitted.

7. Language

NOTE: *An application including a signed oath or declaration may be filed in a language other than English. A verified English translation of the non-English language application and the processing fee of \$130.00 required by 37 CFR 1.17(k) is required to be filed with the application, or within such time as may be set by the Office. 37 CFR 1.52(d).*

NOTE: *A non-English oath or declaration in the form provided or approved by the PTO need not be translated. 37 CFR 1.69(b).*

- ☒ English
☐ Non-English
☐ The attached translation is a verified translation. 37 C.F.R. 1.52(d).

8. Assignment

- ☒ An assignment of the invention to Ricon Corporation

- ☒ is attached. A separate ☐ "COVER SHEET FOR ASSIGNMENT (DOCUMENT) ACCOMPANYING NEW PATENT APPLICATION" or ☒ FORM PTO 1595 is also attached.

- ☐ will follow.

NOTE: *"If an assignment is submitted with a new application, send two separate letters—one for the application and one for the assignment." Notice of May 4, 1990 (1114 O.G. 77-78).*

WARNING: *A newly executed "CERTIFICATE UNDER 37 CFR 3.73(b)" must be filed when a continuation-in-part application is filed by an assignee. Notice of April 30, 1993, 1150 O.G. 62-64.*

9. Certified Copy

Certified copy(ies) of application(s)

| | | |
|---------|------------|-------|
| Country | Appln. no. | Filed |
| Country | Appln. no. | Filed |
| Country | Appln. no. | Filed |

from which priority is claimed

☐ is (are) attached.

☐ will follow.

NOTE: The foreign application forming the basis for the claim for priority must be referred to in the oath or declaration. 37 CFR 1.55(a) and 1.63.

NOTE: This item is for any foreign priority for which the application being filed directly relates. If any parent U.S. application or International Application from which this application claims benefit under 35 U.S.C. 120 is itself entitled to priority from a prior foreign application, then complete item 18 on the ADDED PAGES FOR NEW APPLICATION TRANSMITTAL WHERE BENEFIT OF PRIOR U.S. APPLICATION(S) CLAIMED.

10. Fee Calculation (37 C.F.R. 1.16)

A. ☐ Regular application

| CLAIMS AS FILED | | | |
|---|--------------|------|--|
| Number filed | Number Extra | Rate | Basic Fee 37 C.F.R. 1.16(a) \$790.00 |
| Total Claims (37 CFR 1.16(c)) 35- 20 = | 15 | × | \$ 22.00 |
| Independent Claims (37 CFR 1.16(b)) 3 - 3 = | 0 | × | \$ 82.00 |
| Multiple dependent claim(s), if any (37 CFR 1.16(d)) | | + | \$260.00 |

☐ Amendment cancelling extra claims is enclosed.

☐ Amendment deleting multiple-dependencies is enclosed.

☐ Fee for extra claims is not being paid at this time.

NOTE: If the fees for extra claims are not paid on filing they must be paid or the claims cancelled by amendment, prior to the expiration of the time period set for response by the Patent and Trademark Office in any notice of fee deficiency. 37 CFR 1.16(d).

Filing Fee Calculation

\$ 1,120.00

- B. ☐ Design application
(\$330.00—37 CFR 1.16(f))

Filing Fee Calculation \$ _____

- C. ☐ Plant application
(\$530.00—37 CFR 1.16(g))

Filing fee calculation \$ _____

11. Small Entity Statement(s)

- ☐ Verified Statement(s) that this is a filing by a small entity under 37 CFR 1.9 and 1.27 is (are) attached.

WARNING: "Status as a small entity in one application or patent does not affect any other application or patent, including applications or patents which are directly or indirectly dependent upon the application or patent in which the status has been established. A nonprovisional application claiming benefit under 35 U.S.C. 119(e), 120, 121 or 365(c) of a prior application may rely on a verified statement filed in the prior application if the nonprovisional application includes a reference to a verified statement in the prior application or includes a copy of the verified statement filed in the prior application if status as a small entity is still proper and desired." 37 C.F.R. § 1.28(a).

(complete the following, if applicable)

- ☐ Status as a small entity was claimed in prior application
_____ / _____, filed on _____, from which benefit
is being claimed for this application under:

35 U.S.C. ☐ 119(e),
☐ 120,
☐ 121,
☐ 365(c),

and which status as a small entity is still proper and desired.

- ☐ A copy of the verified statement in the prior application is included.

Filing Fee Calculation (50% of A, B or C above)

\$ _____

NOTE: Any excess of the full fee paid will be refunded if a verified statement and a refund request are filed within 2 months of the date of timely payment of a full fee. The two-month period is not extendable under § 1.136. 37 CFR 1.28(a).

12. Request for International-Type Search (37 C.F.R. 1.104(d))

(complete, if applicable)

- ☐ Please prepare an international-type search report for this application at the time when national examination on the merits takes place.

13. Fee Payment Being Made at This Time

☐ Not Enclosed

☐ No filing fee is to be paid at this time.

(This and the surcharge required by 37 C.F.R. 1.16(e) can be paid subsequently.)

☒ Enclosed

☒ Basic filing fee

\$ 1,120.00

☒ Recording assignment

(\$40.00; 37 C.F.R. 1.21(h))

(See attached "COVER SHEET FOR
ASSIGNMENT ACCOMPANYING NEW
APPLICATION".)

\$ 40.00

☐ Petition fee for filing by other than all the
inventors or person on behalf of the inventor
where inventor refused to sign or cannot be
reached

(\$130.00; 37 C.F.R. 1.47 and 1.17(h))

\$ _____

☐ For processing an application with a
specification in

a non-English language

(\$130.00; 37 C.F.R. 1.52(d) and 1.17(k))

\$ _____

☐ Processing and retention fee

(\$130.00; 37 C.F.R. 1.53(d) and 1.21(l))

\$ _____

☐ Fee for international-type search report

(\$40.00; 37 C.F.R. 1.21(e))

\$ _____

NOTE: 37 CFR 1.21(l) establishes a fee for processing and retaining any application that is abandoned for failing to complete the application pursuant to 37 CFR 1.53(d) and this, as well as the changes to 37 CFR 1.53 and 1.78, indicate that in order to obtain the benefit of a prior U.S. application, either the basic filing fee must be paid, or the processing and retention fee of § 1.21(l) must be paid, within 1 year from notification under § 53(d).

Total fees enclosed

\$ 1,160.00

14. Method of Payment of Fees

☒ Check in the amount of \$ 1,160.00

☐ Charge Account No. _____ in the amount of
\$ _____.

A duplicate of this transmittal is attached.

NOTE: Fees should be itemized in such a manner that it is clear for which purpose the fees are paid. 37 CFR 1.22(b).

15. Authorization to Charge Additional Fees

WARNING: If no fees are to be paid on filing, the following items should not be completed.

WARNING: Accurately count claims, especially multiple dependent claims, to avoid unexpected high charges, if extra claim charges are authorized.

- ☒ The Commissioner is hereby authorized to charge the following additional fees by this paper and during the entire pendency of this application to Account No. 18-2222.

☒ 37 C.F.R. 1.16(a), (f) or (g) (filing fees)

☒ 37 C.F.R. 1.16(b), (c) and (d) (presentation of extra claims)

NOTE: Because additional fees for excess or multiple dependent claims not paid on filing or on later presentation must only be paid or these claims cancelled by amendment prior to the expiration of the time period set for response by the PTO in any notice of fee deficiency (37 CFR 1.16(d)), it might be best not to authorize the PTO to charge additional claim fees, except possibly when dealing with amendments after final action.

☐ 37 C.F.R. 1.16(e) (surcharge for filing the basic filing fee and/or declaration on a date later than the filing date of the application)

☐ 37 C.F.R. 1.17 (application processing fees)

WARNING: While 37 CFR 1.17(a), (b), (c) and (d) deal with extensions of time under § 1.136(a), this authorization should be made only with the knowledge that: "Submission of the appropriate extension fee under 37 C.F.R. 1.136(a) is to no avail unless a request or petition for extension is filed." (Emphasis added). Notice of November 5, 1985 (1060 O.G. 27).

☐ 37 C.F.R. 1.18 (issue fee at or before mailing of Notice of Allowance, pursuant to 37 C.F.R. 1.311(b))

NOTE: Where an authorization to charge the issue fee to a deposit account has been filed before the mailing of a Notice of Allowance, the issue fee will be automatically charged to the deposit account at the time of mailing the notice of allowance. 37 CFR 1.311(b).

NOTE: 37 CFR 1.28(b) requires "Notification of any change in loss of entitlement to small entity status must be filed in the application . . . prior to paying, or at the time of paying, . . . issue fee." From the wording of 37 CFR 1.28(b): (a) notification of change of status must be made even if the fee is paid as "other than a small entity" and (b) no notification is required if the change is to another small entity.

16. Instructions as to Overpayment

☒ Credit Account No. 18-2222

☐ Refund

Reg. No. 36,998

Tel. No. (818) 783-0990

T. D. Chen 5/15/98

SIGNATURE OF ATTORNEY

Tony D. Chen

(type or print name of attorney)

15910 Ventura Blvd., Suite 1601

P.O. Address

Encino, California 91436-2815

☒ **Incorporation by reference of added pages**

(check the following item if the application in this transmittal claims the benefit of prior U.S. application(s) (including an international application entering the U.S. stage as a continuation, divisional or C-I-P application) and complete and attach the ADDED PAGES FOR NEW APPLICATION TRANSMITTAL WHERE BENEFIT OF PRIOR U.S. APPLICATION(S) CLAIMED)

- ☐ Plus Added Pages for New Application Transmittal Where Benefit of Prior U.S. Application(s) Claimed

Number of pages added _____

- ☐ Plus Added Pages for Papers Referred to in Item 4 Above

Number of pages added _____

- ☒ Plus "Assignment Cover Letter Accompanying New Application"

Number of pages added 1 _____

☐ **Statement Where No Further Pages Added**

(if no further pages form a part of this Transmittal, then end this Transmittal with this page and check the following item)

- ☐ This transmittal ends with this page.